

DEVELOPMENT OF THE TEST TO MEASURE THE KNOWLEDGE ABOUT RESEARCH RECOMMENDATIONS OF ANAND AGRICULTURAL UNIVERSITY

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ABSTRACT

Anand Agricultural University conducts various experiments at different research stations as per problems of the farmers related to agricultural activities. After conducting the research, different research recommendations are given by research stations and Agricultural Universities. For knowing the knowledge about research recommendations this knowledge test was developed. For the preparation of the knowledge test with 50 items (questions), 50 research recommendations were selected by proportionate random method to give proportional weightage to major three areas, i.e. variety, crop practices and plant protection. There were total 30 items in final knowledge test to measure the knowledge about research recommendations after working out 'Index of item difficulty', 'Index of item discrimination' and 'Index of item validity'. The test was found to be reliable (0.93) and valid.

Keywords : anand agricultural university, knowledge, research recommendations

INTRODUCTION

Being the largest component of India's economy, agriculture is of outmost importance for the vast number of people. Agriculture sector employs 54.6% of the total workforce. The Agricultural Universities are major partners in growth & development of agricultural research and education under National Agricultural Research System. In these, different researches are conducted for improvement of the agriculture, such as research conducted for improvement of quality of seeds by breeder, pesticides by plant protectionist, fertilizers by soil scientist, package of practices by agronomist. Anand Agricultural University conducts various experiments at different research stations as per problems of the farmers related to agricultural activities. After conducting the research they bring out different research recommendations.

OBJECTIVE

To develop the test to measure the knowledge about research recommendations of Anand Agricultural University

METHODOLOGY

Item collection

Research recommendations made by Anand Agricultural University during the years 2004 to 2014 were only taken into consideration, as it is assumed that transfer of research recommendations take about two years to reach its clients. From establishment year of AAU 2004 to 2014

total 431 research recommendations about agriculture, agricultural engineering, food processing, animal science and dairy were approved for the farmers of middle Gujarat. Among these 431 research recommendations, 317 research recommendations were of agriculture. Out of this 317 research recommendations, 52, 151 and 114 research recommendations were regarding variety, crop practices and plant protection, respectively. Anand district was selected for study, hence the research recommendations made for Anand district were only considered for the preparation of the knowledge test. Thus, the research recommendations made for major growing crops of Anand district i.e. 4 cereal crops, 1 cash crop, 13 vegetable crops, 4 fruit crops and 3 fodder crops were including in the knowledge test. Further, for these crops, AAU has made 168 research recommendations during the years 2004 to 2014 for farmers of Anand district, so these 168 research recommendations were considered for the preparation of the knowledge test. Out of these 168 research recommendations, 33, 74 and 61 were regarding variety, crop practices and plant protection, respectively. Finally, for the preparation of the knowledge test with 50 items (questions), 50 research recommendations were selected by proportionate random method to give proportional weightage to major three areas, i.e. variety, crop practices and plant protection. Hence, 10, 22 and 18 research recommendations regarding variety, crop practices and plant protection made by AAU during 2004 to 2014 for Anand district were consider randomly for the preparation of the knowledge test for the study. Methodology adopted as used by Saini (2017).

Item analysis

The item analysis used by Jha and Singh (1970) was carried out so as to yield three kinds of information, viz., ‘Index of item difficulty’, ‘Index of item discrimination’ and ‘Index of item validity’. The items were administered to 42 respondents for item analysis. The respondents for administering the items were randomly selected and were not included in the sample for final study. This was done to avoid testing effect. Each one of the 42 respondents, to whom the test was administered, was given a score 1 or 0 for each item, according to whether the answer was right or wrong. The total number of correct answers given by the respondent out of collected items was the knowledge score of the individual. After calculating the score obtained by 42 respondents, the scores were arranged from highest to lowest in order of magnitude. These 42 respondents were divided into six equal groups, each groups having ‘7’ respondents and were arranged in descending order of total scores obtained by them. These groups were named as G₁, G₂, G₃, G₄, G₅ and G₆, respectively. For item analysis, the middle two groups, i.e. G₃ and G₄ were eliminated. Only following four extreme groups with high and low scores were considered for computation of item difficulty and item discrimination indices:

Group	Serial no. of the respondents in descending order	No. of respondents
G1	1 to 7	7
G2	8 to 14	7
G5	29 to 35	7
G6	36 to 42	7

Calculation of difficulty index (P_i)

The difficulty index of an item is defined as the proportion of respondents giving correct answer to that particular item. This was calculated by the following formula:

Where,

P_i = Difficulty index in percentage of the ith item

n_i = Number of respondents giving correct answer to ith item

N_i = Total number of respondents

Note: Range of P_i values for final selection of the item were 20 to 80 per cent as per the decided criteria by Jha and Singh (1970).

Calculation of discrimination index (E^{1/3})

The discrimination index can be obtained by calculating the phi-coefficient as formulated by Perry and Michael (1951). However, Mehta (1958) in using E^{1/3} method to find out item discrimination emphasized that this method

was analogous to, and hence, a convenient substitute for the phi-coefficient. The (E^{1/3}) was used in the research study.

Where,

S₁, S₂, S₅, and S₆ = The frequencies of correct answers in groups G₁, G₂, G₅ and G₆, respectively

N = Total number of respondents in the sample of item analysis

Note: Range of E^{1/3} values for final selection of the item were 0.21 to 0.79 as per the decided criteria by Jha and Singh (1970).

Calculation of biserial correlation

It was used for the test item validation, when the criteria of validity are regarded as internal consistency that is, the relationship of total score to a dichotomized response to any given item. Keeping this in view, with the help of following formula suggested by Guilford (1965), the Biserial correlation for each of the item was calculated. The significance of the Biserial correlation coefficient was tested by using the formula given by Guilford (1965). The items found significant at 0.5 per cent level of significance was included in the final format of the knowledge test battery.

Where,

M_p = Mean of X values for higher group and lower group (Giving correct answer of particular item) in dichotomized variable

M_q = Mean of X values for higher group and lower group (Giving wrong answer of particular item) in dichotomized variable

p = Proportion of cases in higher and lower group (Giving correct answer of particular item)

q = Proportion of cases in higher and lower group (Giving wrong answer of particular item)

y = Ordinance of the unit normal distribution curve with surface equal to 1.0 at the point of division between segments containing p and q proportion of the cases

σ_i = Standard deviation

Representative of the Test

Though the aforesaid criteria were the main consideration for the final selection of the knowledge items, the cares were taken not to eliminate the important aspects if any. In this way eight items were included in the final format of the knowledge test. Finally, there were total 30 items in

final knowledge test to measure the knowledge about research recommendations

Reliability of the Test

A test is reliable when it consistently produces the same results when it applied to the same sample. In the present study to test the reliability of the test, the split half method was used. The 30 statements were divided into two halves with 15 odd- numbered in one half and 15 even-numbered statements in the other. These were administered to 30 respondents. Each of the two sets of statements was treated as a separate test and then these two sub-tests were correlated. The co-efficient of reliability was calculated by the Rulon's formula (Guilford, 1954), which came to 0.87. However, reliability is directly related to the length of the test when we split to odd and even number items. The reliability coefficient which has been calculated is the value of half size of the original test. Thus correction factor is calculated by using Spearman Brown formula. Which came to 0.93. Thus, the test developed was found highly reliable.

Final Knowledge test to measure the knowledge about research recommendations of Anand Agricultural University

1 Which of the following variety of Paddy is recommended for areas of middle Gujarat cultivating non-irrigated drilled paddy?

- A) Ashoka - 200 F
- B) Gujarat Anand Rice – 13
- C) Gujarat - 17

2 Which of the following variety of Brinjal have oblong and less-seeded fruits as well as have less infestation of sucking pest?

- A) Gujarat Anand Oblong Brinjal – 2
- B) Gujarat Anand Brinjal Hybrid – 3
- C) Gujarat Oblong Brinjal – 1

3 Which of the following variety of Okra have attractive and dark colored fruits which found more resistance towards yellow mosaic virus and sucking pest?

- A) Gujarat Okra Hybrid - 1
- B) Gujarat Anand Okra - 5
- C) Gujarat Junagadh Okra - 3

4 Which of the following variety of Ridge Gourd shows less incidence of mosaic and downey mildew disease?

- A) Gujarat Anand Ridge Gourd - 1
- B) Pusa Nasdar
- C) Gujarat Ridge Gourd Hybrid – 1

5 Which of the following variety of Sorghum known as forage sorghum which is used for multiple cuttings and shows fewer incidences of pests?

- A) GAFS - 11
- B) CoFS - 29
- C) S - 1049

6 Which variety of Hybrid Napier grass contains more amount of crude protein and liked by cattles as well as borders have less roughness and recommended for irrigated and non-irrigated areas?

- A) APBN - 1
- B) AB - 21
- C) Co – 3

7 Which of the following variety of Bidi Tobacco is recommended for root-knot nematode infested growing area?

- A) Anand Bidi Tobacco - 10
- B) GABT - 11
- C) MRGTH – 1

8 Which of the following is recommended as organic fertilizer for Paddy crop in middle Gujarat?

- A) Dhaincha green manure
- B) Caster cake
- C) Both of the above

9 Before planting of Gurjari variety of Paddy, which of the following is recommended for mixing in the soil during puddling?

- A) Paddy straw (3 tonnes / hectore) and Neem green leaves (1 tonne / hectore)
- B) Paddy straw (1 tonne / hectore) and Gliricidia green leaves (5 tonnes / hectore)

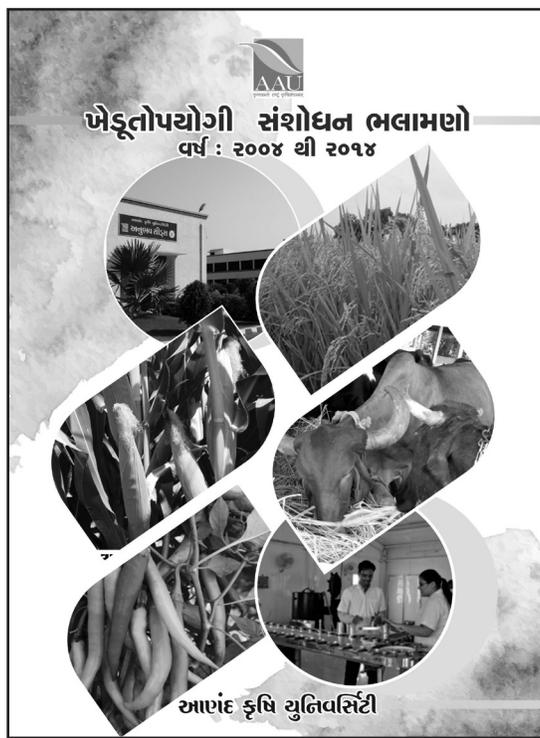
- C) Paddy straw (5 tonnes / hecter) and Basil green leaves (5 tonnes / hecter)
- 10 How much amount of zinc with which compost is recommended for the farmers' fields having medium concentration of zinc who adopting Pearl millet - Wheat cropping system?**
- A) 2.5 kilogram Zinc and 200 kilogram farm yard manure / hecter
B) 6 kilogram Zinc and 60 kilogram sewage sludge / hecter
C) 10 kilogram Zinc and 200 kilogram vermicompost / hecter
- 11 How many tonnes of vermicompost and caster cake and how many kilos of nitrogen and phosphorous per hecter are recommended for getting higher yield of green cob to the farmers who growing Sweet Corn?**
- A) 2 tonnes vermicompost, 1.2 tonnes caster cake, 90 kilos nitrogen and 45 kilos phosphorous
B) 6 tonnes vermicompost, 3 tonnes caster cake, 120 kilos nitrogen and 60 kilos phosphorous
C) 12 tonnes vermicompost, 7 tonnes caster cake, 180 kilos nitrogen and 90 kilos phosphorous
- 12 Which growth hormone is recommended to spray in the fields of the farmers cultivating Chilli to increase the crop production and to maintain quality of seeds?**
- A) Ethylene
B) Abscisic acid
C) Gibberellic acid
- 13 How much amount of nitrogen per hecter is recommended for drip irrigated Potato in middle Gujarat?**
- A) 100 kilograms / hecter
B) 180 kilograms / hecter
C) 250 kilograms / hecter
- 14 How many per cent of neutralized ferrous sulphate solution is recommended to spray after 30, 50 and 70 days of transplanting in the fields of the farmers cultivating Tomato where, soil contain medium level of iron and zinc?**
- A) 0.5 per cent solution of ferrous sulphate
B) 5 per cent solution of ferrous sulphate
C) 7 per cent solution of ferrous sulphate
- 15 What is the recommended dose of nitrogen – phosphorous – potash and farm yard manure per plant of Banana crop in middle Gujarat?**
- A) 50-25-25 grams / plant N-P-K and 5 kilograms farm yard manure
B) 100-50-50grams / plant N-P-K and 25 kilograms farm yard manure
C) 200-100-100 grams / plant N-P-K and 10 kilograms farm yard manure
- 16 How much dose of zinc sulphate and ferrous sulphate fertilizer is recommended with recommended dose of N-P-K fertilizer in the soil having medium zinc and low iron content for getting higher seed yield in Anand – 2 variety of Lucerne?**
- A) 10 kilograms zinc sulphate / hecter and 5 kilograms ferrous sulphate / hecter
B) 25 kilograms zinc sulphate / hecter and 50 kilograms ferrous sulphate / hecter
C) 60 kilograms zinc sulphate / hecter and 80 kilograms ferrous sulphate / hecter
- 17 How much dose of treated sewage sludge and farm yard manure per hecter is recommended with recommended dose of N-P-K of Pearl millet and Cabbage in Pearl millet – Cabbage cropping system?**
- A) 2.5 tonnes sewage sludge and 10 tonnes farm yard manure
B) 15 tonnes sewage sludge and 50 tonnes farm yard manure
C) 30 tonnes sewage sludge and 25 tonnes farm yard manure
- 18 Which of the following seed treatment is recommended before 12 hours of planting for the control of termite in Wheat?**
- A) Chlorpyrifos 20 EC or Fipronil 5 EC
B) Dicofol 18.5 EC
C) Propargite 57 EC or Fenazaquin 10 EC

- 19 **Which seed treatment is recommended for the control of thrips in Chilli before planting of the seeds in nursery?**
- A) Imidacloprid 70 WS
 B) Deltamethrin 2.8 EC
 C) Cypermethrin 25 EC
- 20 **How many pheromone lure traps are recommended for integrated management of fruit and shoot borer in Brinjal?**
- A) 10 pheromone traps per hectore
 B) 40pheromone traps per hectore
 C) 80pheromone traps per hectore
- 21 **Which of the following is recommended to spray in Tomato crop for the control of green caterpillar?**
- A) NPV 250 ml / hectore
 B) *Verticillium lecanii* 1 kilogram / hectore
 C) None of the above
- 22 **Which of the following is recommended for the integrated management of early blight and leaf curl of Tomato for those farmers who are not capable to purchase costly insecticides?**
- A) One by one spay of Neem leaves 10% solution and mancozeb 0.2% at the interval of 15 days after the 20 days of transplanting
 B) One by one spay of Basil leaves 5% solution and mancozeb 0.2% at the interval of 15 days after the 20 days of transplanting
 C) One by one spay of Piplal leaves 1% solution and mancozeb 0.2% at the interval of 15 days after the 20 days of transplanting
- 23 **Which of the following is recommended for the control of fruit borer in Cowpea?**
- A) Flubendiamide 48 SC or Chlorantraniliprole 20 SC
 B) Dicofol 18.5 EC or Fenpyroximate 5 SC
 C) Monocrotophos 36 EC
- 24 **How many pheromone traps are recommended at a flowering stage for the control of fruit fly to the farmers who grow Bitter Gourd?**
- A) 5 pheromone traps per hectore
 B) 15 pheromone traps per hectore
 C) 30 pheromone traps per hectore
- 25 **Minimum how much time is recommended to be kept between last spray of mancozeb 75 WP / WG which is used for the control of fungal diseases and harvesting of Potato for preventing the problem of crop residue?**
- A) 5 days
 B) 34 days
 C) 60 days
- 26 **Which of the following insecticide is recommended for spraying in Cabbage for the control of aphid and green caterpillar?**
- A) *Verticillium lecanii*
 B) *Beauveria bassiana*
 C) Both of the above
- 27 **Minimum how much time is recommended to be kept between last spray of quinalphos 25 EC and harvesting of the curd of Cauliflower for preventing the problem of crop residue?**
- A) 10 days
 B) 40 days
 C) 1 day
- 28 **Which of the following is recommended to spray for the effective control of aphids to the farmers who have Aonla orchards?**
- A) Imidacloprid 17.8 SL
 B) Deltamethrin 2.8 EC
 C) Propargite 57 EC
- 29 **Which of the following is recommended for the control of leaf eating caterpillar in Bidi Tobacco?**
- A) Chlorpyrifos 50% + Cypermethrin 5% EC
 B) Acephate 25% + Fenvalerate 3% EC
 C) Acephate 50% + Imidacloprid 1.8 EC
- 30 **Which insecticide at which time is recommended to spray in Bidi Tobacco nursery for the control of root-knot nematode?**
- A) Carbosulphan insecticide before 1 day and after 25 days

of planting in nursery

B) Fenazaqui7n insecticide before 2 day and after 30 days of planting in nursery

C) Propargite insecticide at the day of planting and after 10 days of planting in nursery



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